PRINCETON APPLIED RESEARCH®

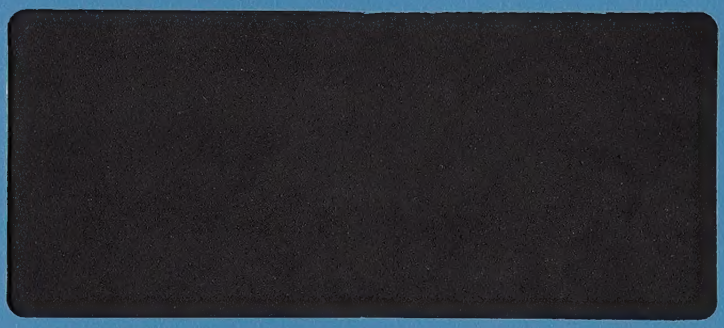
2512

SCHEMATICS FOR MODEL 170 ELECTROCHEMICAL SYSTEM

MP MASTER
MA29044

PRINCETON APPLIED RESEARCH CORPORATION

PRINCETON, NEW JERSEY



SCHEMATICS FOR MODEL 170

ELECTROCHEMICAL SYSTEM

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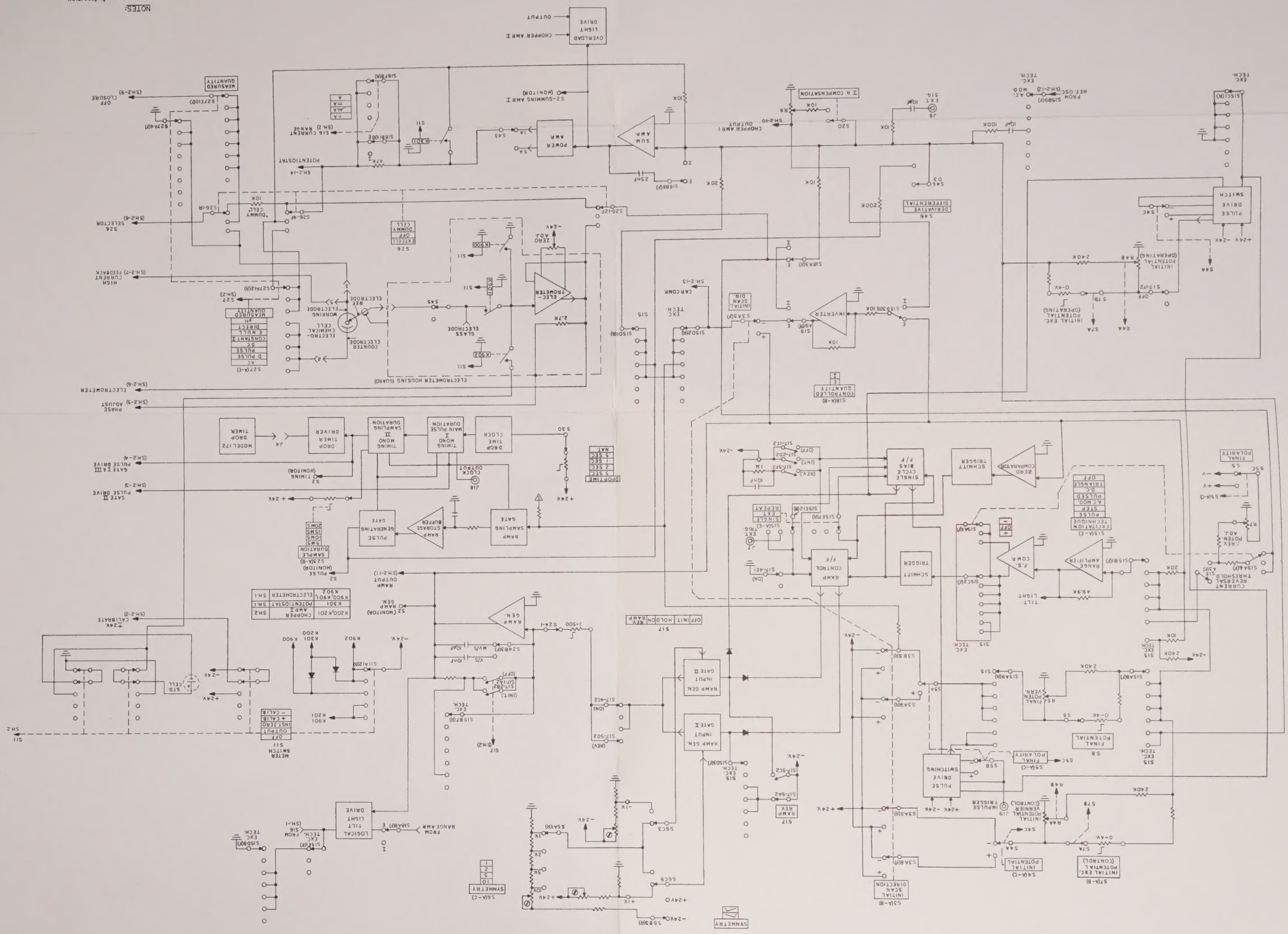
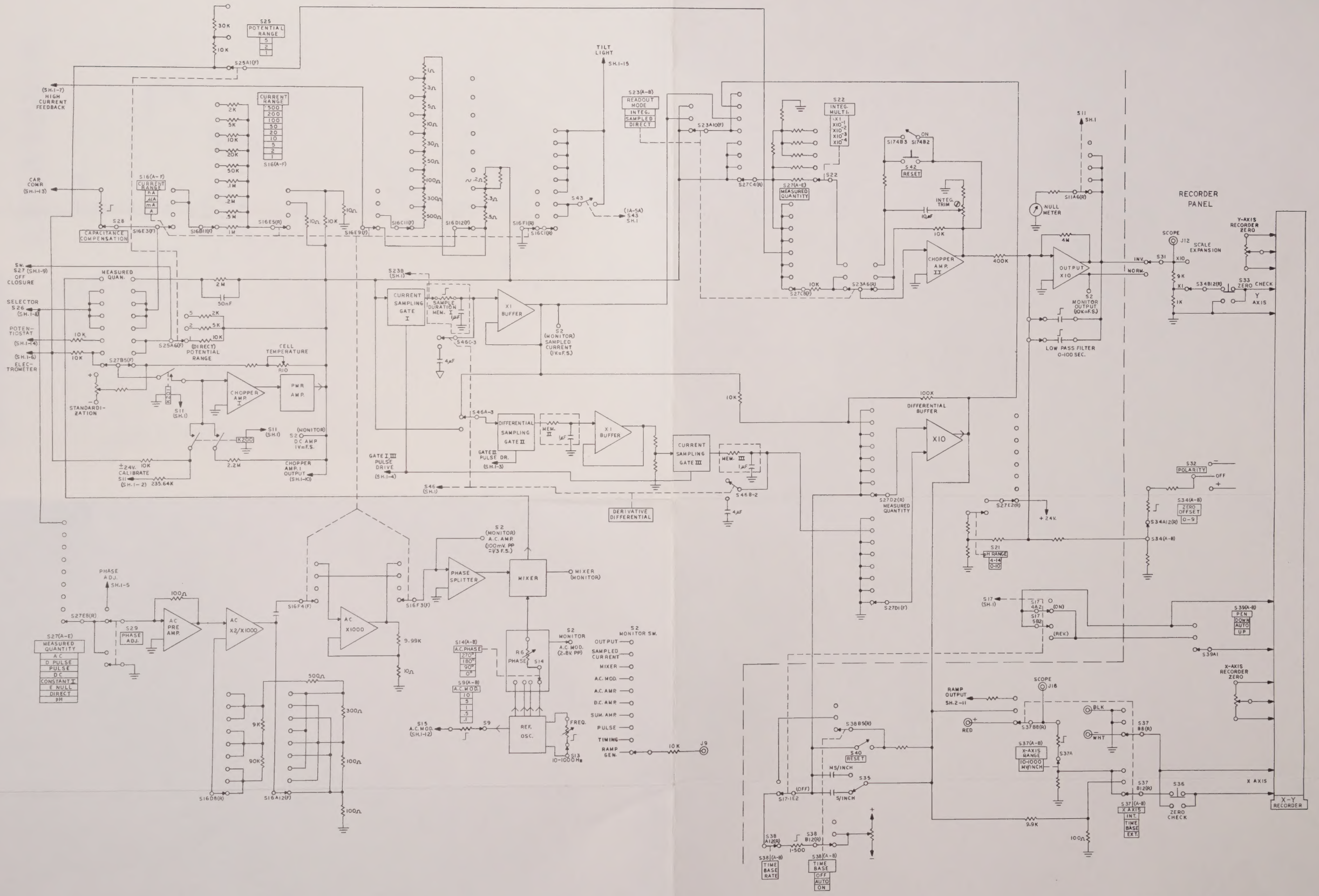
SHEET 1 OF 2 | 5002 | E | 501

MODEL 170

SECTION I PROGRAMMER AND POTENTIOSTAT
BLOCK DIAGRAM
ELECTROCHEMICAL SYSTEM

NOTES:
1. S17 SHOWN IN "ON" POSITION.


OVERLOAD LIGHT DRIVE
CHOPPER AMP I OUTPUT
S2-SUMMING AMP I (MONITOR)
I R COMPENSATION
CHOPPER AMP I OUTPUT
SUM. AMP.
POWER AMP.
S16 CURRENT (SH.2) RANGE
POTENTIOSTAT
MEASURED QUANTITY
CLOSURE (SH.2-9)
ELECTROMETER (SH.2-6)
PHASE ADJUST (SH.2-3)
HIGH CURRENT (SH.2-7) FEEDBACK
ELECTROMETER HOUSING (GUARD)
ELECTRO-CHEMICAL CELL
WORKING ELECTRODE
REF. ELECTRODE
COUNTER ELECTRODE
GLASS ELECTRODE
ELECTRO-METER
DUMMY CELL
EXT CELL OFF DUMMY CELL
ZERO ADJ.
INVERTER
CAR COMP
INITIAL SCAN DIR
CONTROLLED QUANTITY
DEFINITIVE DIFFERENTIAL
INITIAL POTENTIAL (OPERATING)
INITIAL EXC. POTENTIAL (OPERATING)
PULSE DRIVE SWITCH
+24V. -24V.
FROM OSC. (SH.2-12) REF. OSC. MOD.
EXC. TECH.
CURRENT REVERSAL THRESHOLD
REV. POTEN. ADJ.
POLARITY
FINAL
STEP
PULSED
A.C. MOD.
D.C.
TRIANGLE
EXCITATION TECHNIQUE
RAMP CONTROL F/F
SINGLE CYCLE BIAS F/F
SCHMITT TRIGGER
ZERO COMPARATOR
RAMP GEN. INPUT GATE I
RAMP GEN. INPUT GATE II
RAMP GEN.
RAMP REV.
OFF INIT HOLD ON REV RAMP
RANGE
AMPLIFIER
F.S. COMP.
TILT LIGHT
FINAL POTENTIAL
FINAL POLARITY
FINAL POTEN. ADJ.
PULSE SWITCHING DRIVE
INPULSE TRIGGER
INITIAL POTENTIAL (CONTROL)
INITIAL EXC. POTENTIAL (CONTROL)
INITIAL SCAN DIRECTION
SYMMETRY
DROP TIME CLOCK
TIMING MONO I MAIN PULSE DURATION
TIMING MONO II SAMPLING DURATION
DROP TIMER DRIVER
MODEL 172 DROP TIMER
DROP TIME NAT 5 SEC 2 SEC 1 SEC .5 SEC
TIMING CLOCK OUTPUT
TIMING (MONITOR)
GATE I & III PULSE DRIVE
GATE II PULSE DRIVE
RAMP SAMPLING GATE
RAMP BUFFER
PULSE STORAGE GENERATING GATE
SAMPLE DURATION (MONITOR)
PULSE (MONITOR)
RAMP OUTPUT (SH.2-11)
RAMP GEN. (MONITOR)
CHOPPER AMP I (SH.2) CALIBRATE
POTENTIOSTAT SH.1
ELECTROMETER SH.1
METER SWITCH S11
OFF OUTPUT ZERO +CALIB -CALIB
STD. CELL
LOGICAL TILT LIGHT DRIVE
RANGE AMP FROM S16
TILT LIGHT EXC. TECH. FROM S16
SYMMETRY
CALIBRATE
+24V. -24V. +1V. -1V.
+24V. REV.
-24V. REV.
+24V. -24V.
+24V.
-24V.
+24V.
-24V.
+24V.
-



SECTION II DETECTOR AND SIGNAL PROCESSING

BLOCK DIAGRAM

ELECTROCHEMISTRY SYSTEM

MODEL 170

NOTES:

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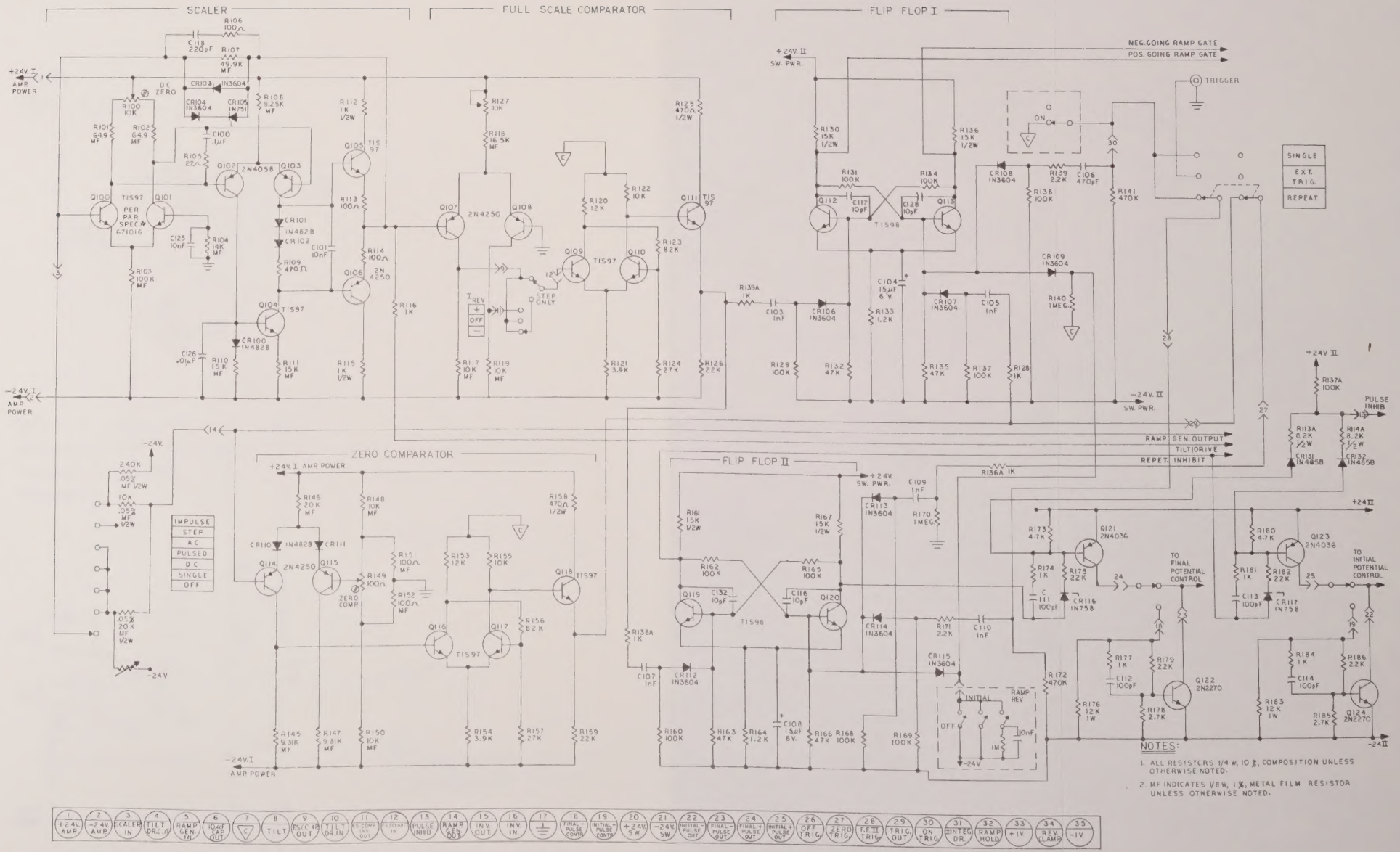

1 +24V AMP.	2 -24V AMP.	3 SCALER IN	4 TILT DRIVE	5 RAMP GEN. IN	6 RAMP GEN OUT	7	8 TILT	9 FS/C 1/2 OUT	10 TILT DR. IN	11 FS COMP. IN/ OUT	12 FS SCALE IN	13 PULSE INHIB	14 RAMP GEN OUT	15 INV. OUT	16 INV. IN	17	18 FINAL - PULSE CONTR	19 INITIAL - PULSE CONTR	20 +24V SW.	21 -24V SW.	22 INITIAL - PULSE OUT	23 FINAL - PULSE OUT	24 FINAL + PULSE OUT	25 INITIAL + PULSE OUT	26 OFF TRIG.	27 ZERO TRIG.	28 F.F. II TRIG.	29 TRIG. OUT	30 ON TRIG.	31 INTEG. DR.	32 RAMP HOLD	33 +1V	34 REV. CLAMP	35 -1V.

PROGRAMMER MODEL 170

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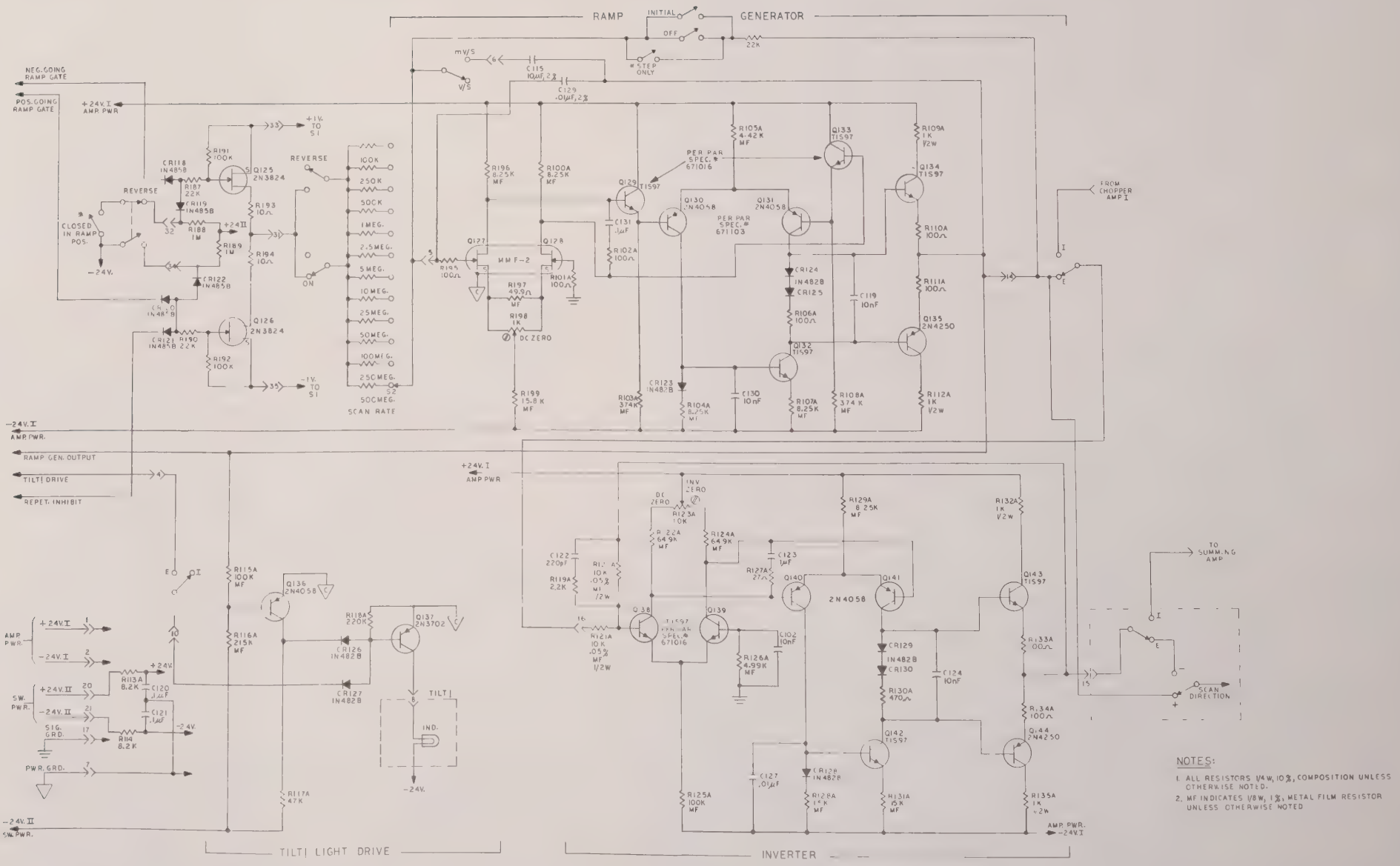

NOTES:

1. ALL RESISTORS 1/4W, 10%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/8W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED

PROGRAMMER MODEL 170

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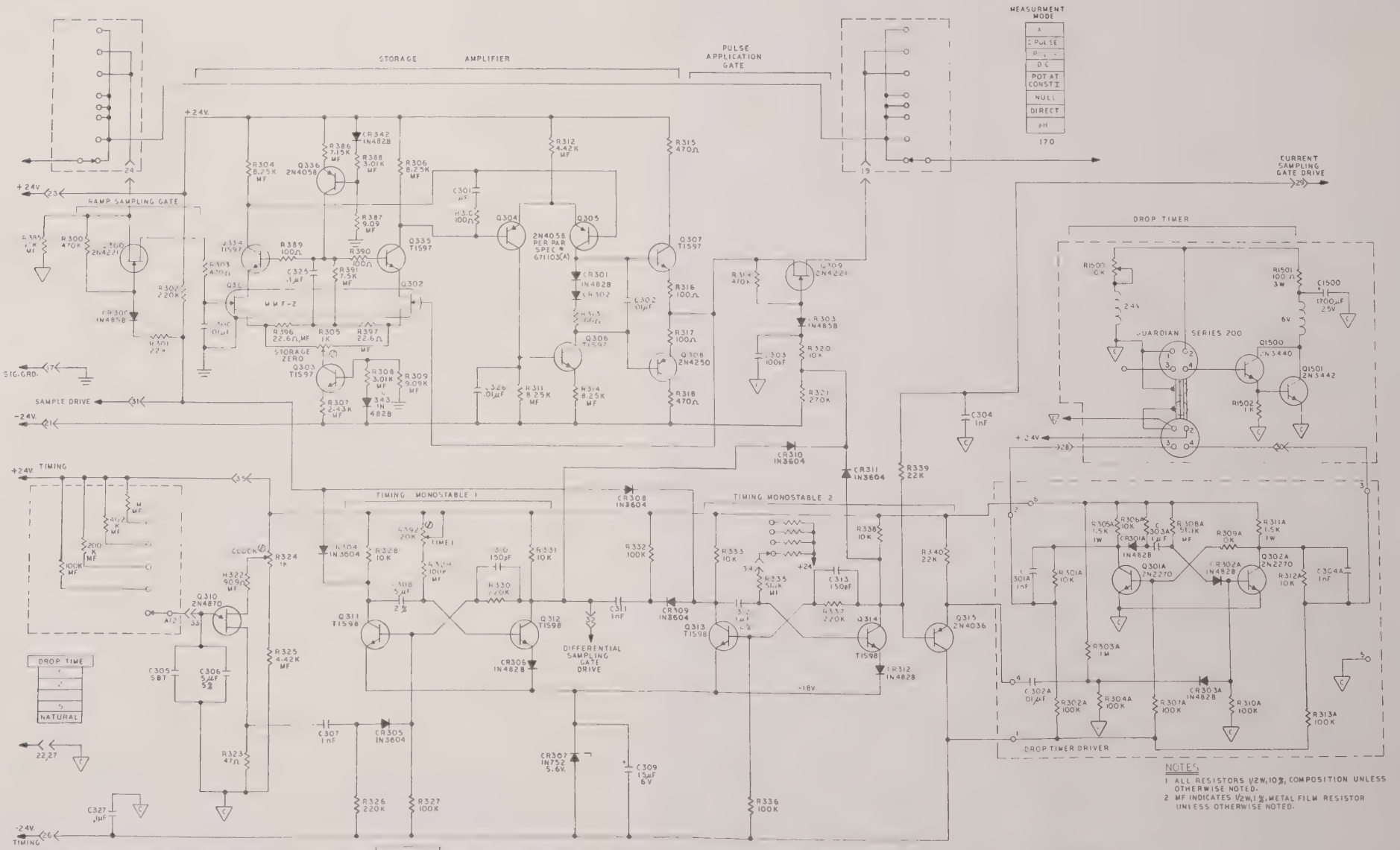

SUMMING AMPLIFIER BOARD MODEL 170

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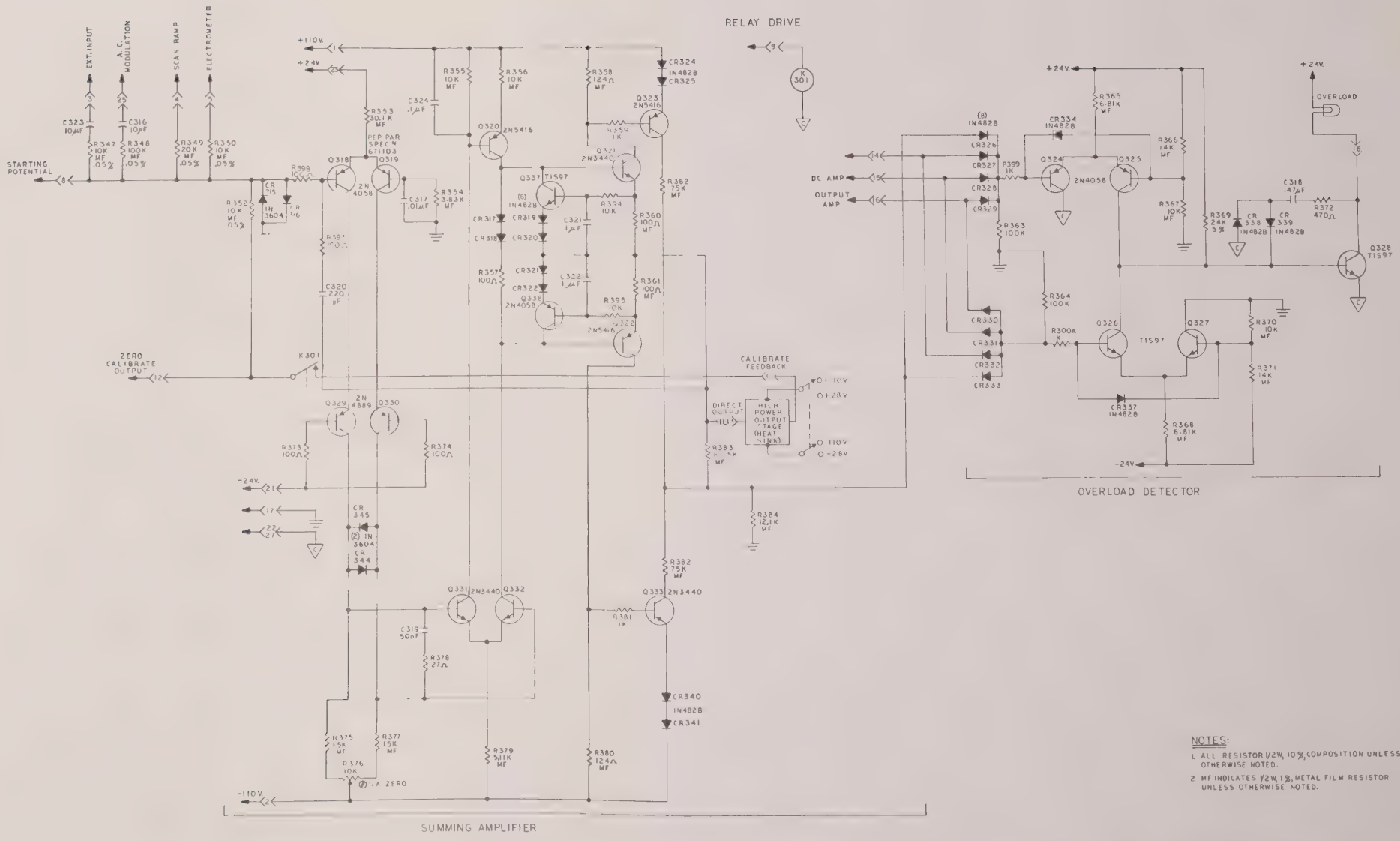

SUMMING AMPLIFIER BOARD MODEL 170

NOTES:

1. ALL RESISTOR 1/2W, 10%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/2W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED.

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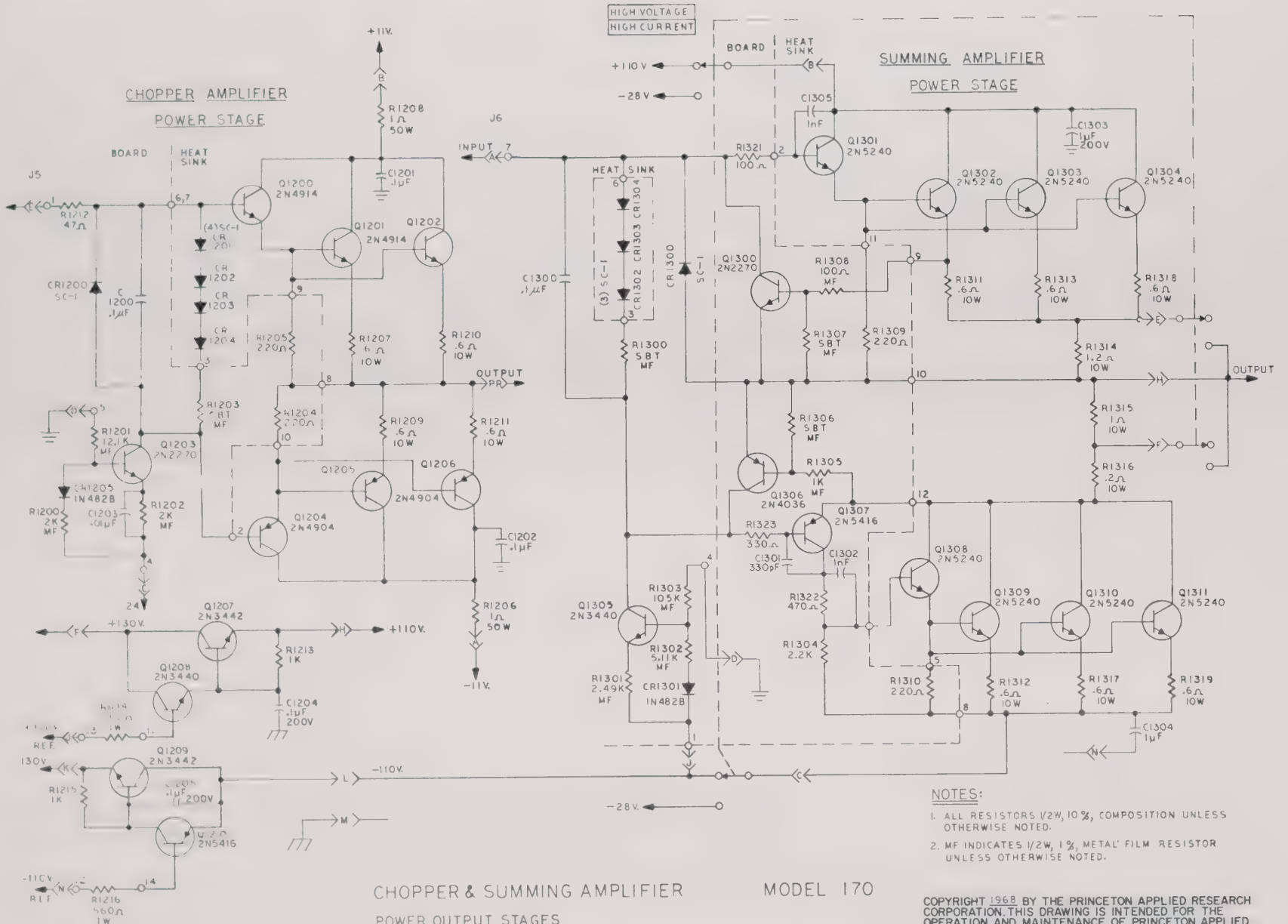

NOTES:

1. ALL RESISTORS 1/2W, 10%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/2W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED.

CHOPPER & SUMMING AMPLIFIER MODEL 170

POWER OUTPUT STAGES

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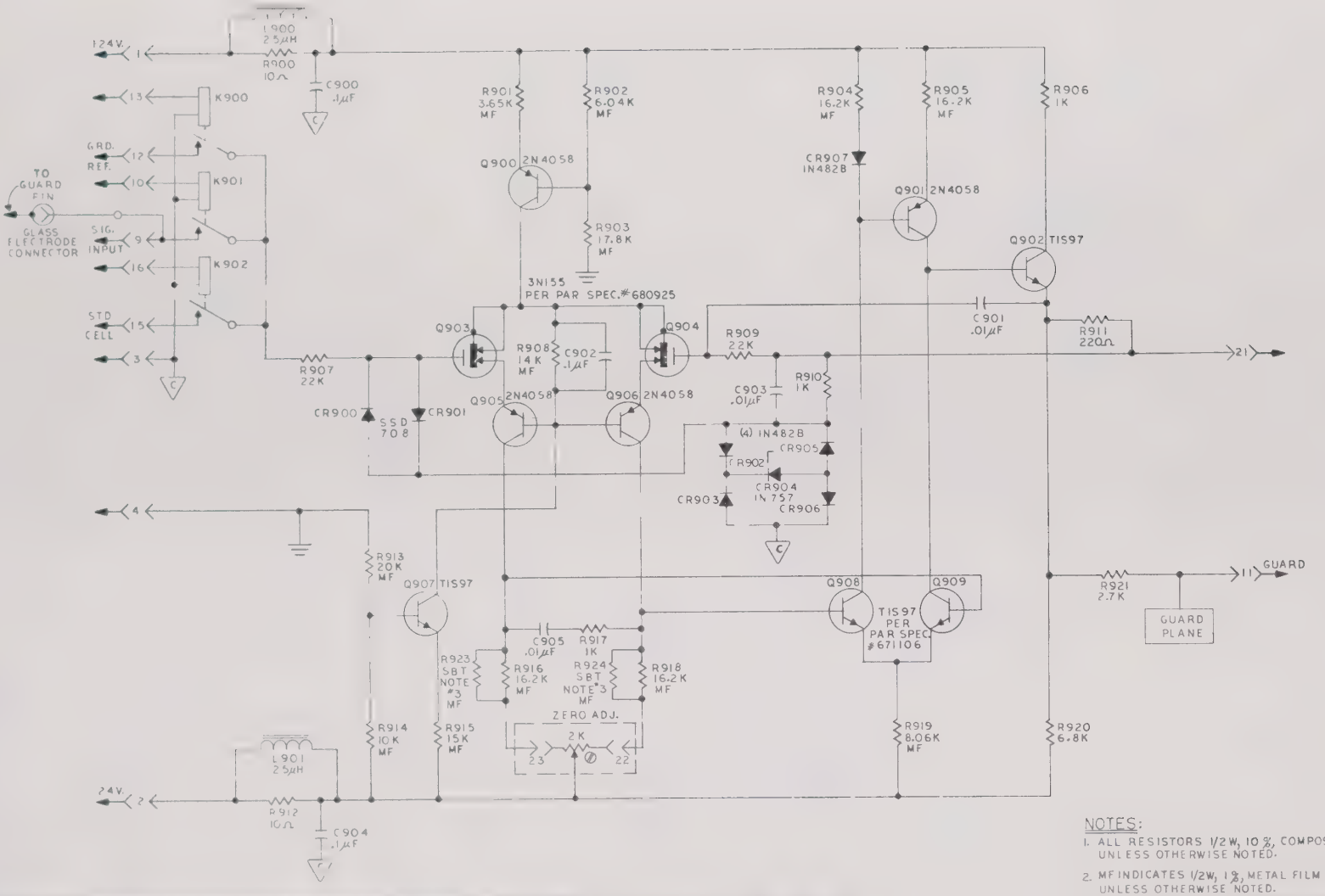

NOTES:

1. ALL RESISTORS 1/2W, 10%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/2W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED.
3. SBT VALUE 100Ω ► 1 USED ONLY ONE

ELECTROMETER

MODEL 170
MODEL 171

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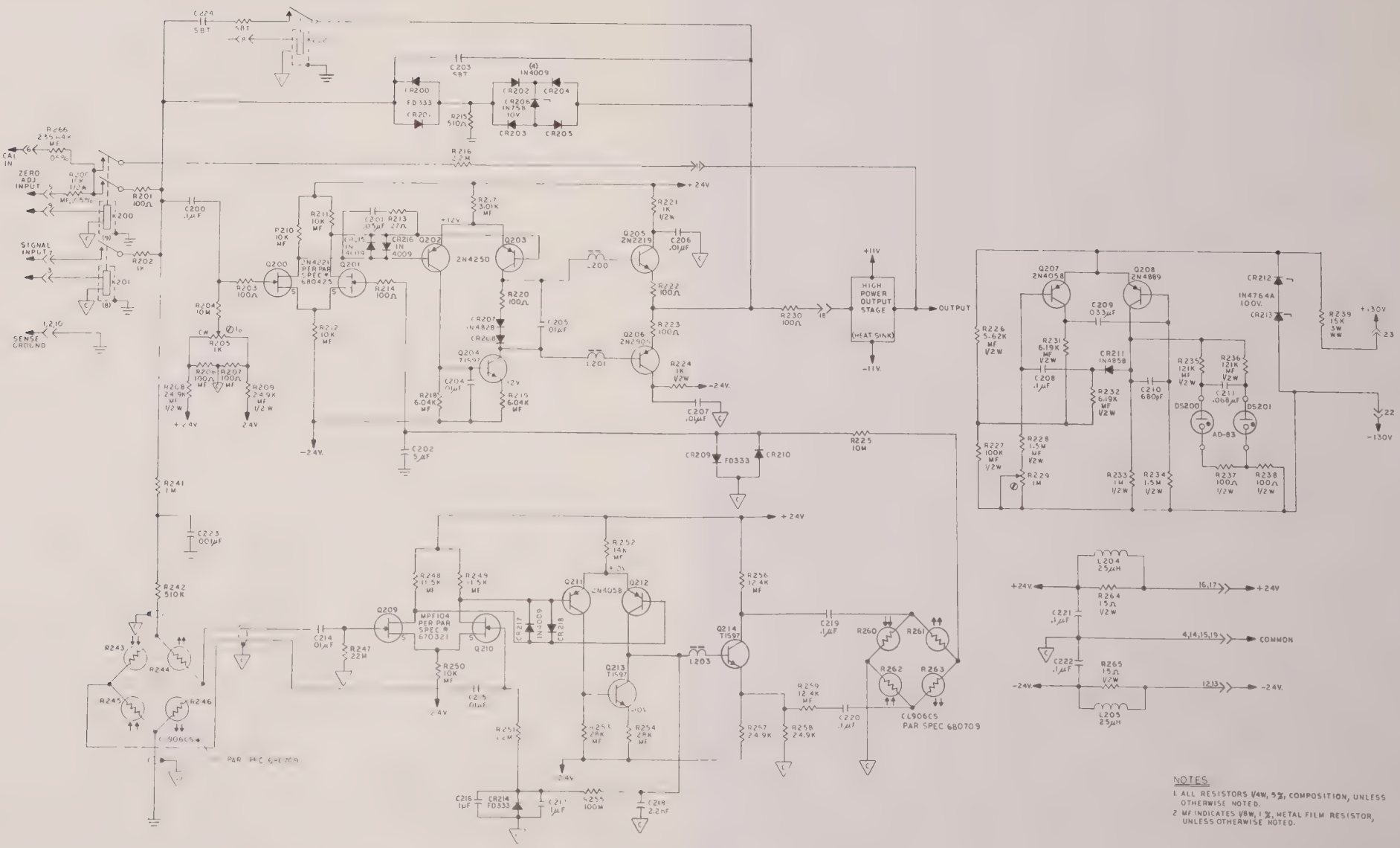

NOTES

1. ALL RESISTORS 1/4W, 5%, COMPOSITION, UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/8W, 1%, METAL FILM RESISTOR, UNLESS OTHERWISE NOTED.

CHOPPER STABILIZED AMPLIFIER I — MODEL 170

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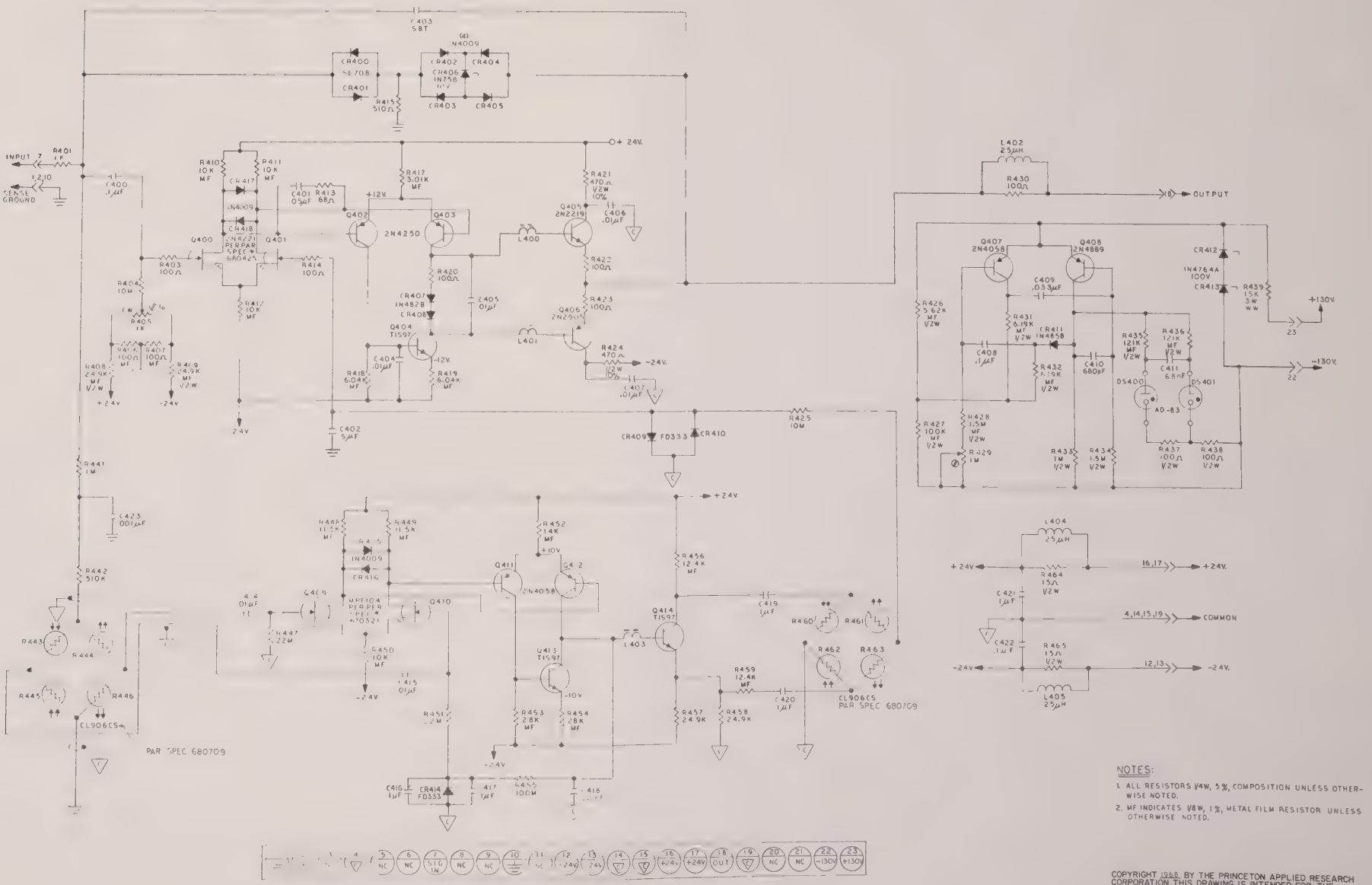
4162 D SD C



NOTES:

1. ALL RESISTORS 1/4W, 5%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/8W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED.

CHOPPER STABILIZED AMPLIFIER II MODEL 170

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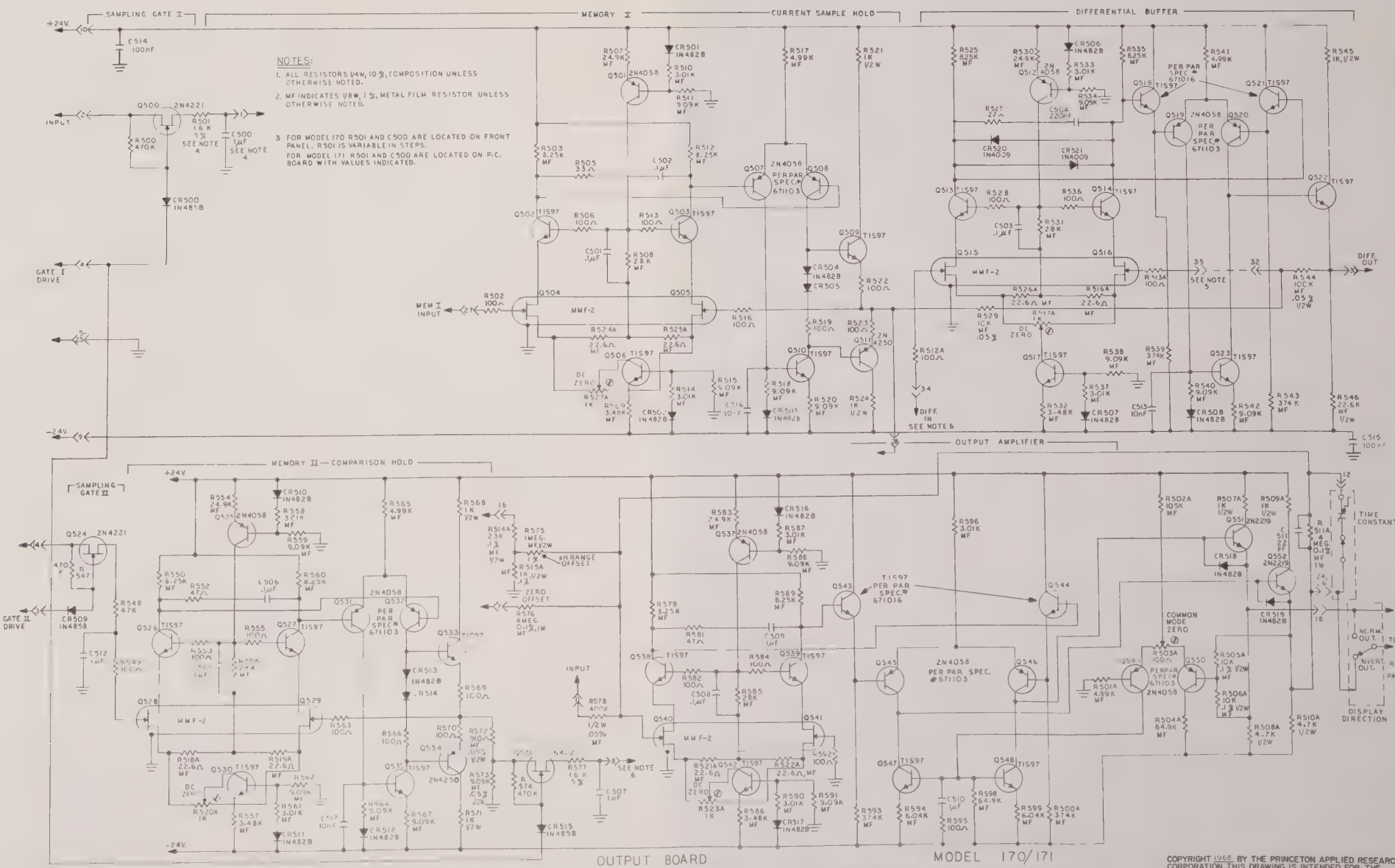
4146 D SD D



NOTES:

1. ALL RESISTORS 1/4W, 10%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/8W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED.
3. FOR MODEL 170 R501 AND C500 ARE LOCATED ON FRONT PANEL. R501 IS VARIABLE IN STEPS.
   FOR MODEL 171 R501 AND C500 ARE LOCATED ON P.C. BOARD WITH VALUES INDICATED.

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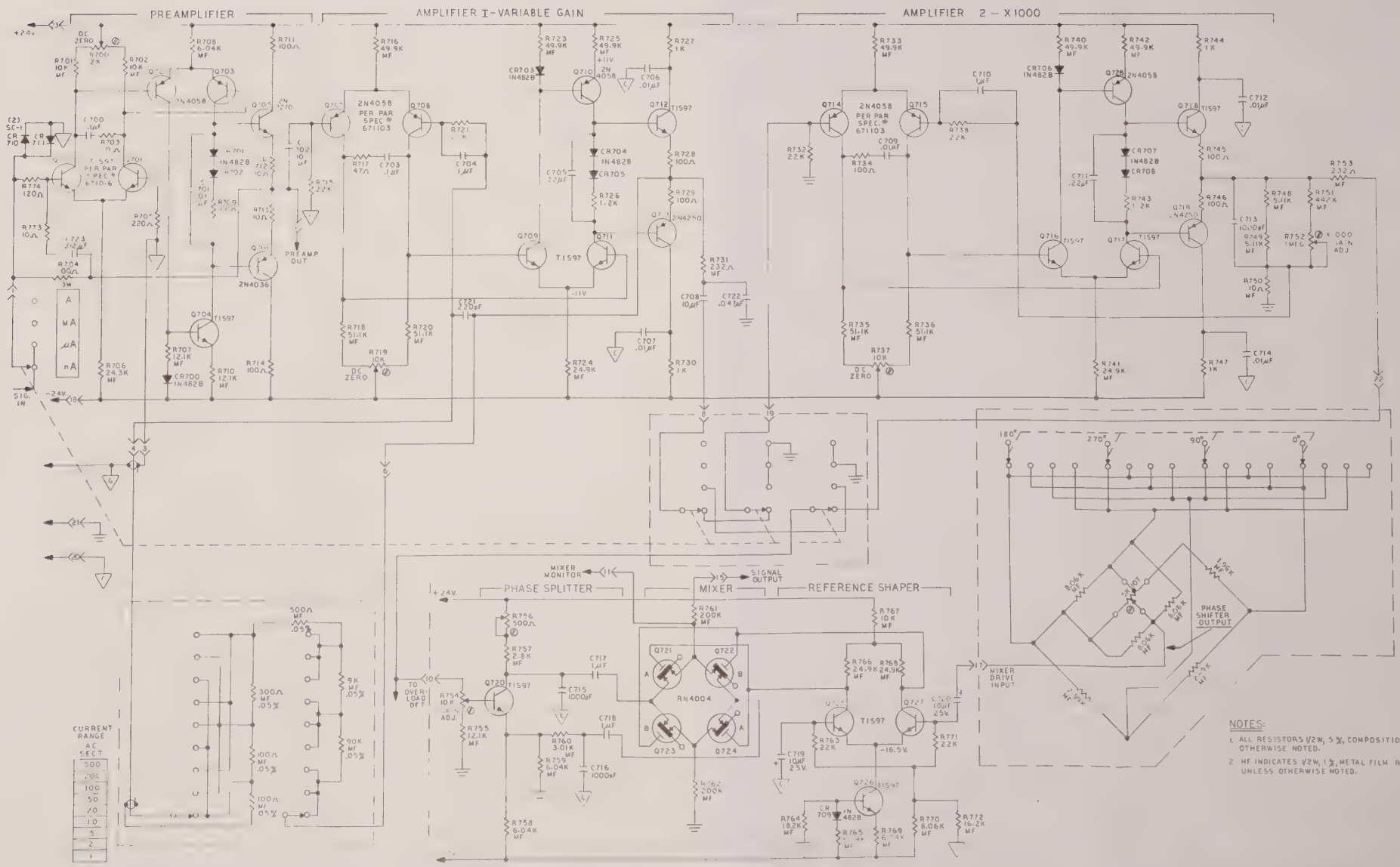

A.C. AMPLIFIER BOARD

MODEL 170/1

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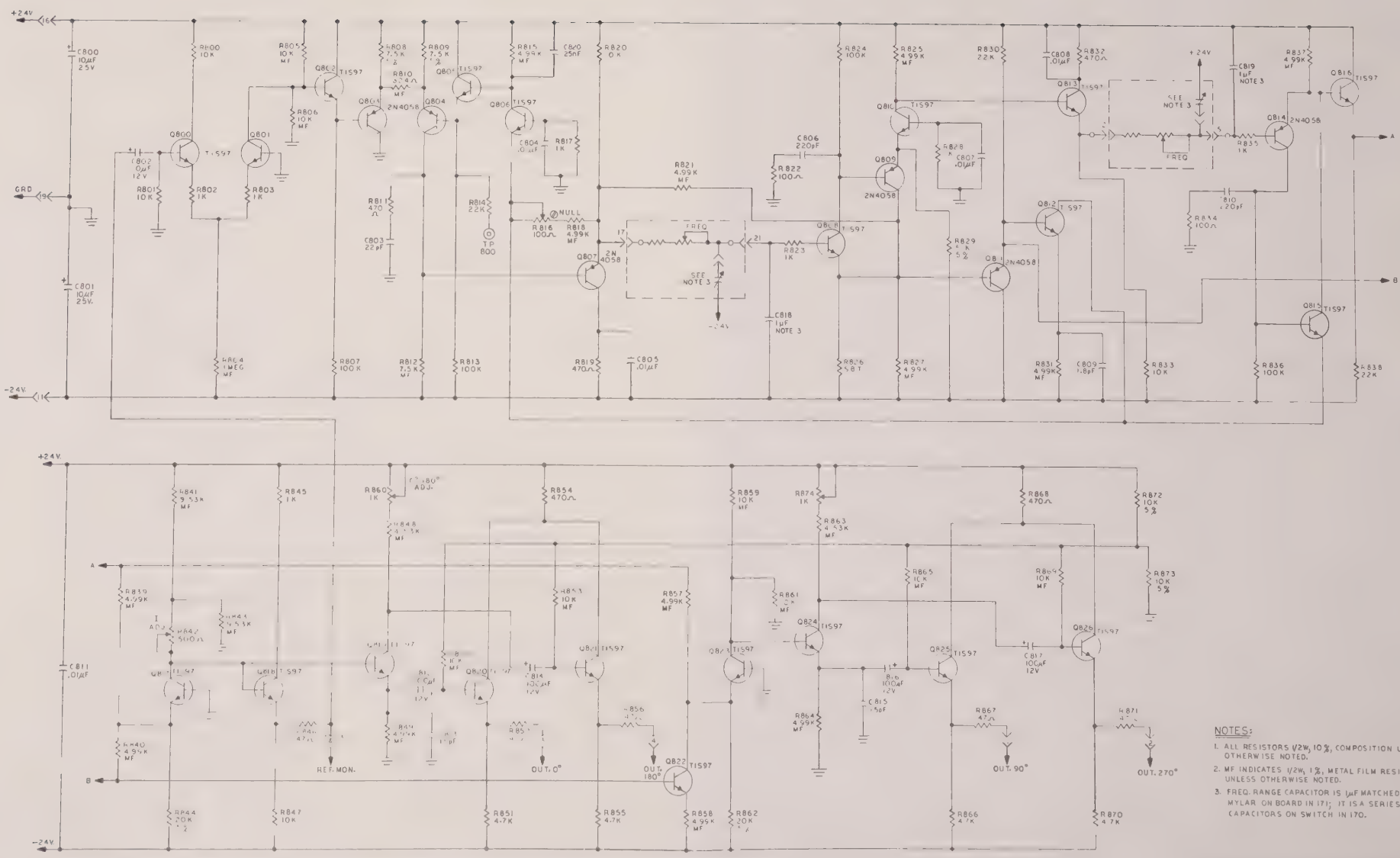

NOTES:

1. ALL RESISTORS 1/2W, 10%, COMPOSITION UNLESS OTHERWISE NOTED.
2. MF INDICATES 1/2W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED.
3. FREQ. RANGE CAPACITOR IS 1μF MATCHED 1% MET. MYLAR ON BOARD IN 171; IT IS A SERIES OF CAPACITORS ON SWITCH IN 170.

REFERENCE OSCILLATOR MODEL 170/171

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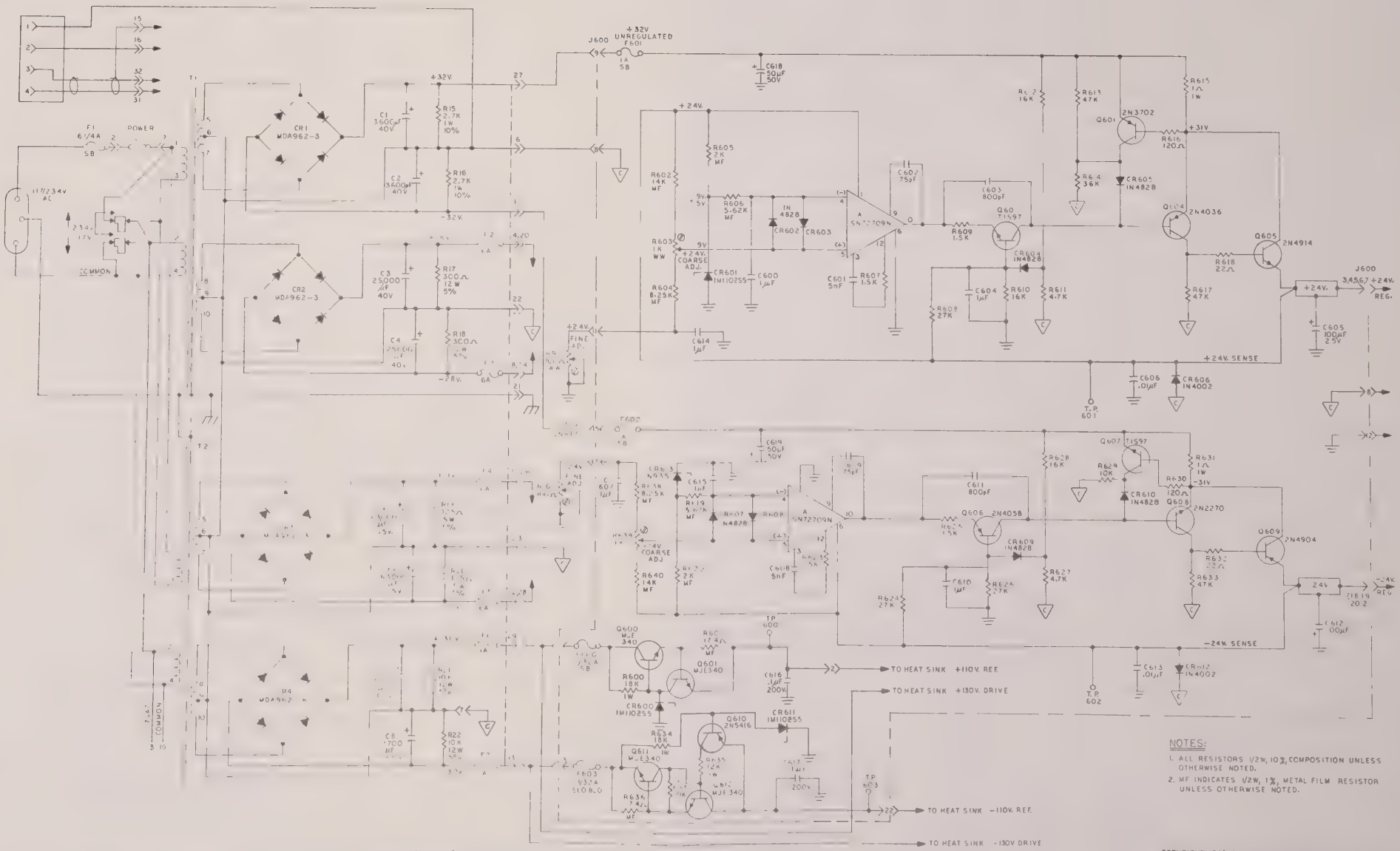

PIN CONNECTOR(BOARD)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
+130V. UNREG	11K Ω REF. Q1	N.C.	+24V REG.	+24V REF.	+24V REG.	+24V REF.	+32V UNREG	+32V UNREG		+24V UNREG		-24V AC		-32V UNREG		-24V REG.	-24V REG.	-24V REG.	-24V REG.	-24V REF.	-110V REF.	-110V N

POWER SUPPLY MODEL 170

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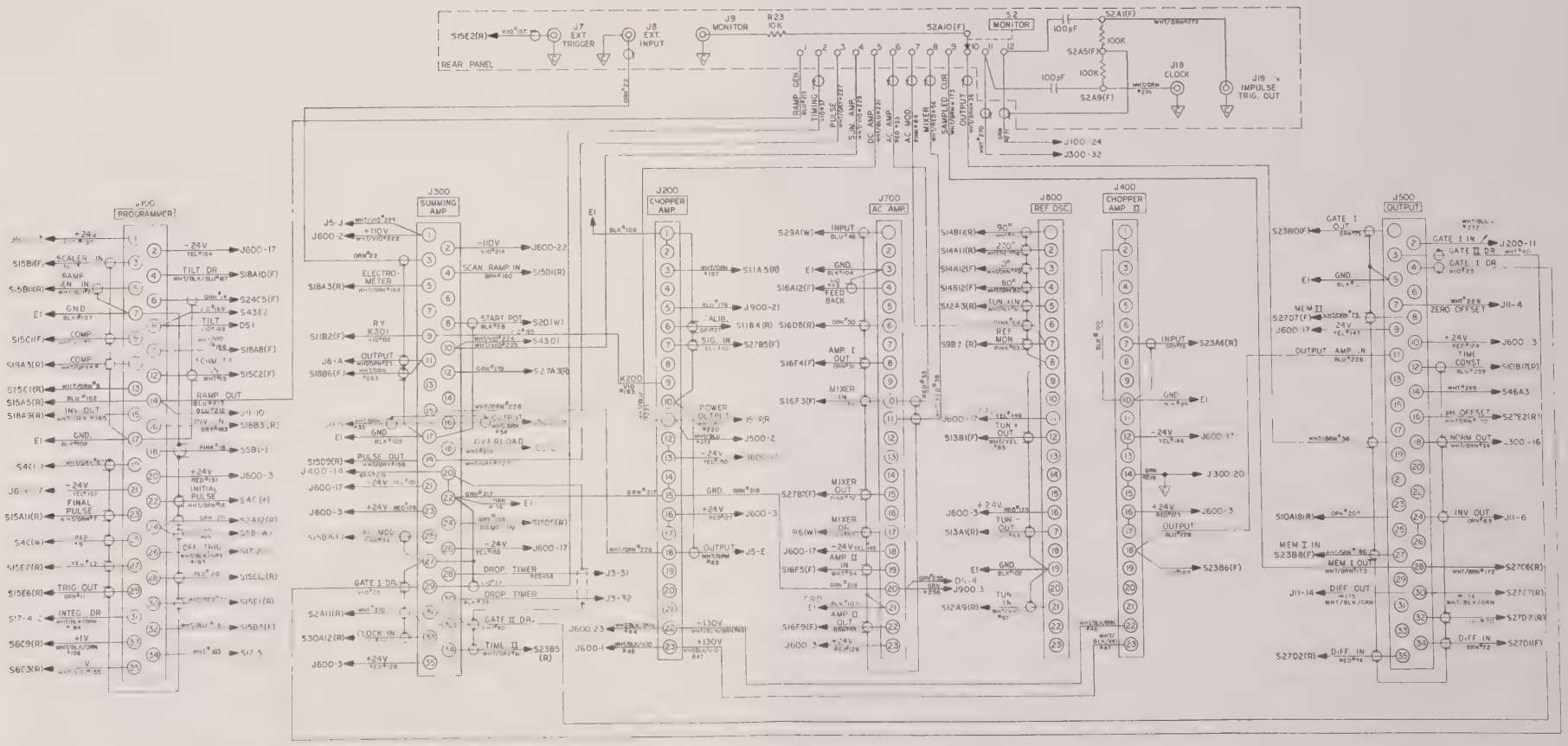

SWITCH/CONNECTOR LEGEND		
CONNECTOR OR SWITCH	SCHEMATIC 4091 SHEET	SUB-TITLE
J7, 8, 9, 100, 200, 300, 400, 500, 700 800, 18, 19	1	PC BD CHASSIS
S2		
J1, 2, 3, 4, 600	2	POWER SUPPLY
S1, 41		
J11 THRU 17	3	RECORDER PANEL
S31-40, 44		
J5, 6	4	CHOP AMP / SUM. AMP POWER STAGE
S43		
J10, 900	5	FRONT PANEL
S3-30, 42, 45, 46		

CHASSIS WIRING SCHEMATIC MODEL 170

PC BD CHASSIS

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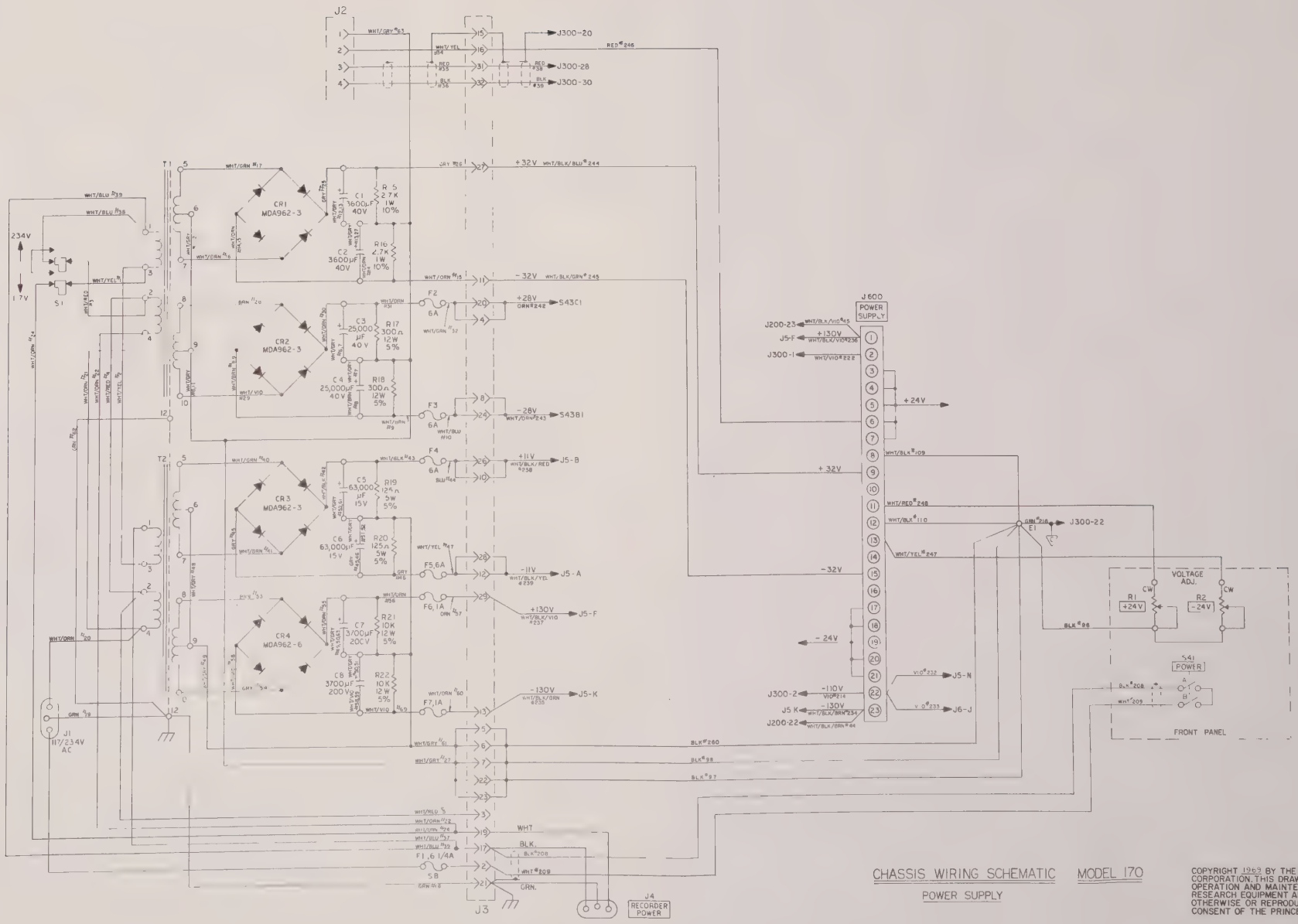

CHASSIS WIRING SCHEMATIC MODEL 170

POWER SUPPLY

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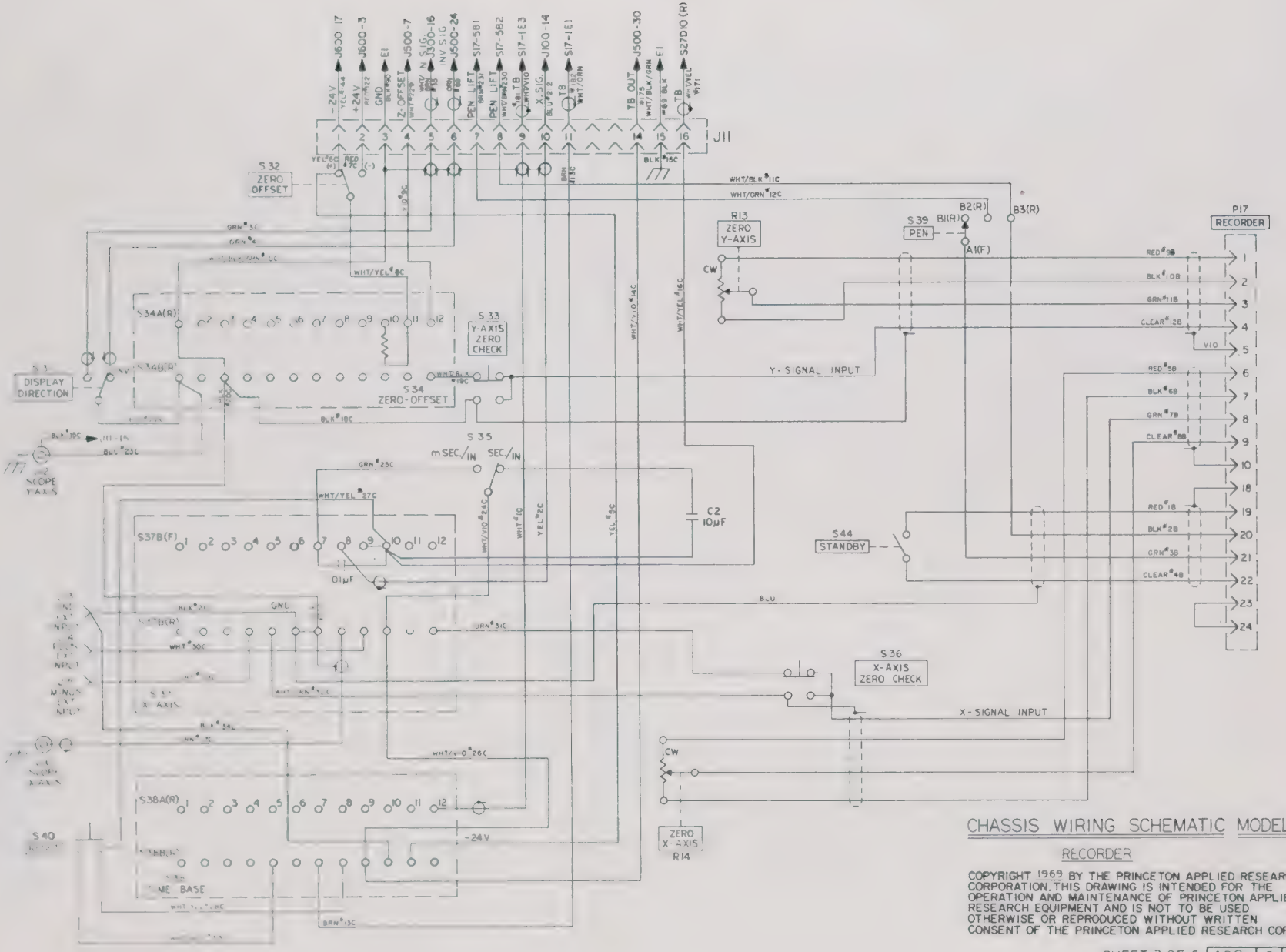

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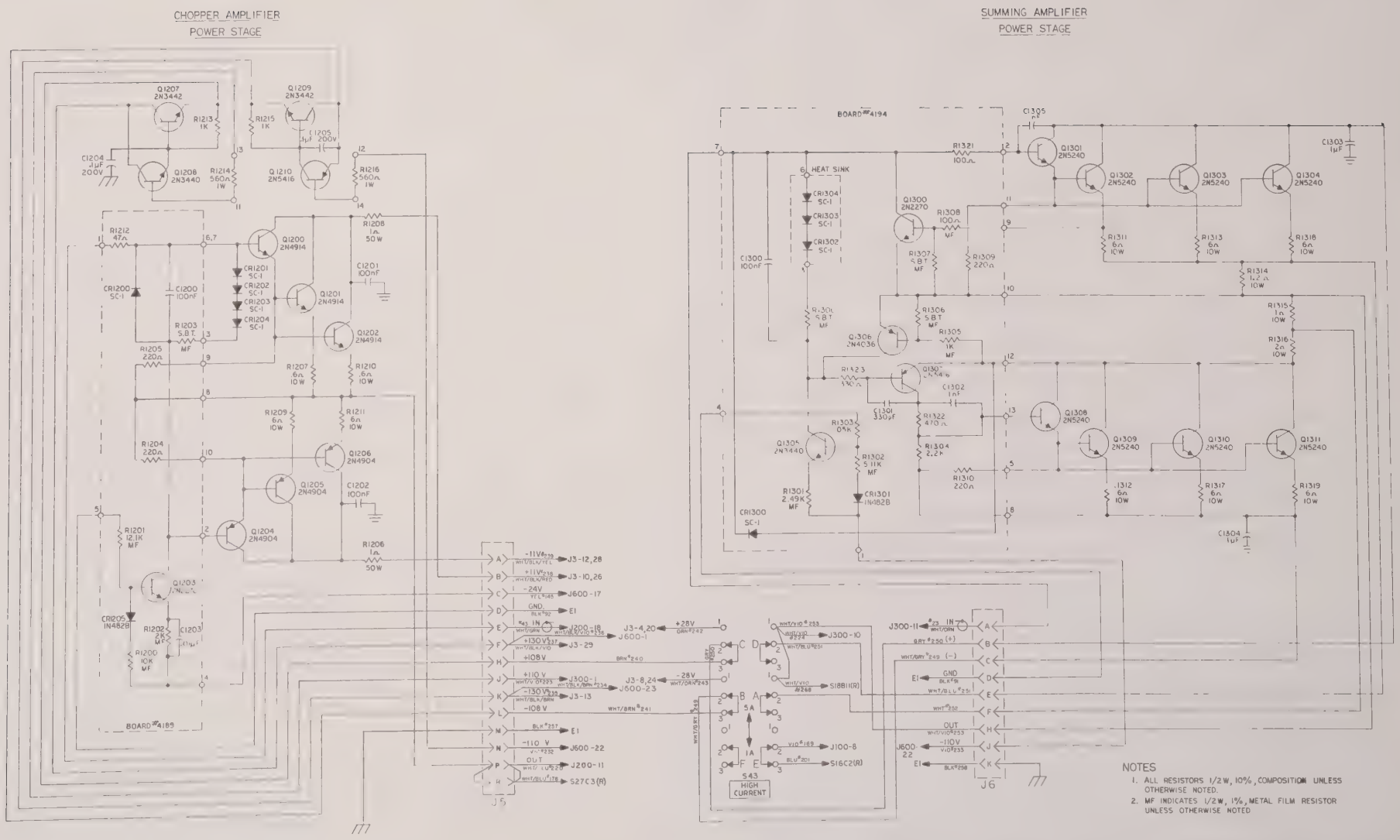

NOTES

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2. MF INDICATES 1/2W, 1%, METAL FILM RESISTOR UNLESS OTHERWISE NOTED

CHASSIS WIRING SCHEMATIC MODEL 170

CHOPPER AMP./ SUMMING AMP. POWER STAGE

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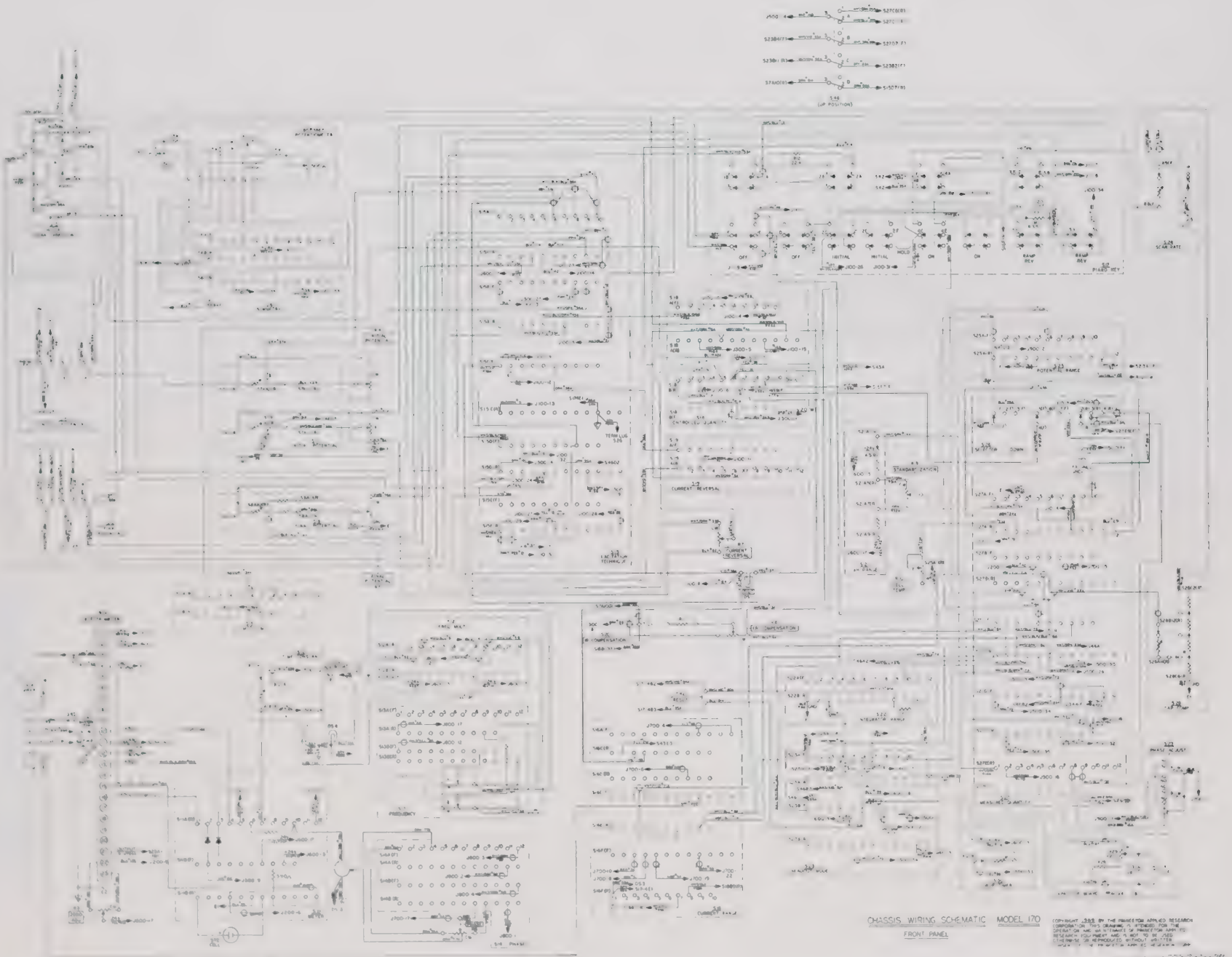

CHASSIS WIRING SCHEMATIC MODEL 170

FRONT PANEL

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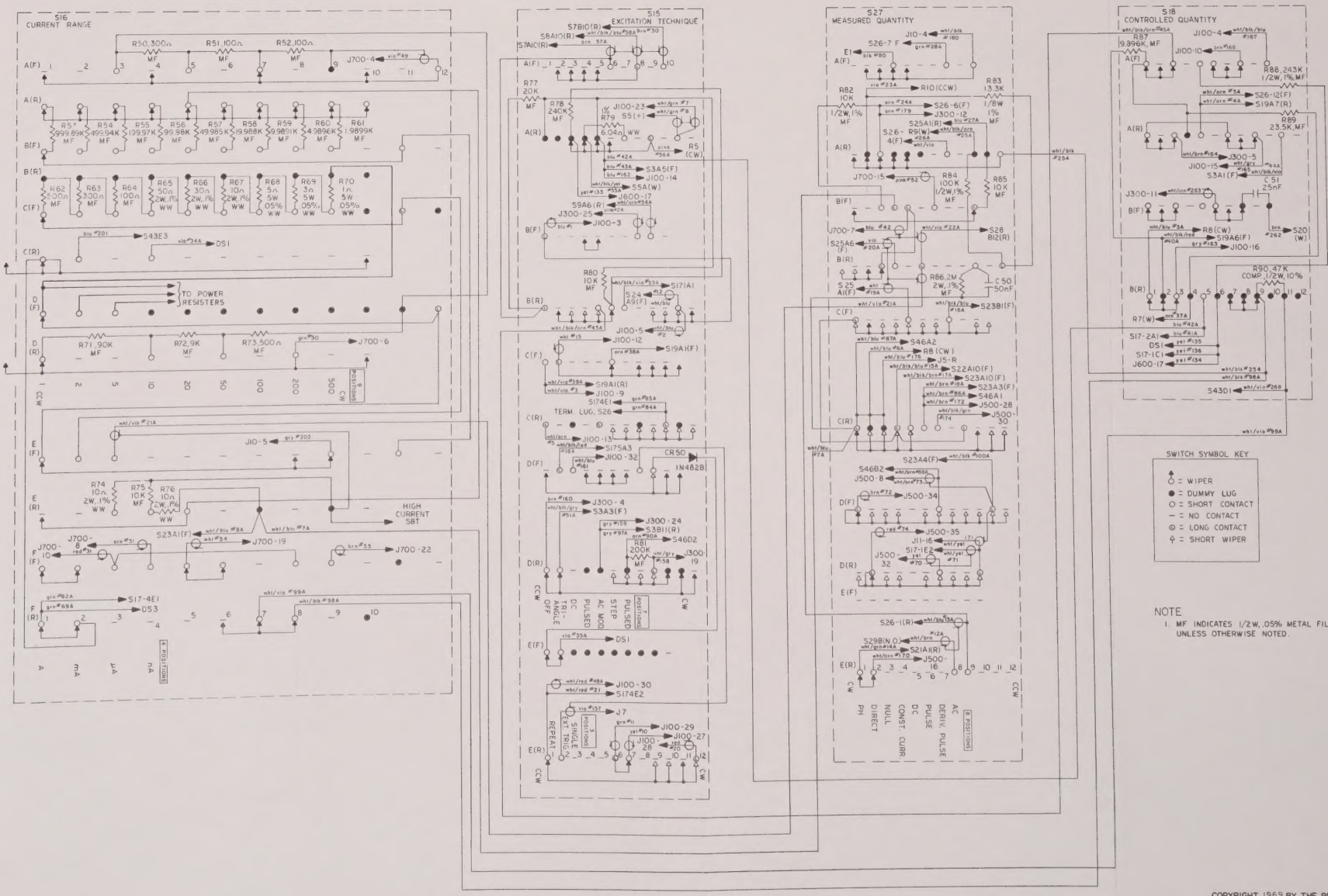

SWITCH SCHEMATIC MODEL 170

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